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AUTHOR Ortiz, Flora Ida; Morelan, Steve J.
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ABSTRACT

The effect of cognitive style and learning conditions on the rote verbal learning performance of Mexican American subjects classified as field independent or field dependent was investigated. Field dependent referred to a strong perceptual influence caused by the context or background while field independent referred to an ability to overcome the influence of a surrounding perceptual field. The sample consisted of 44 Mexican American children, 9 1/2 to 12 years, enrolled in a Southern California public school. The Portable Rod and Frame Test classified subjects as field independent or dependent. The learning component consisted of 3 stages: (1) the response learning stage, which reflected when the subject recalled the response as a unit, (2) the associative one stage, which reflected the first correct association between stimulus and response, and (3) the associative two stage, which indicated actual mastery of the correct association. The subjects were tested in a distraction free room within the school by Mexican American experimenters. One half of the subjects from each group were randomly assigned to one of 2 learning conditions: personalized and impersonalized rewards. Results demonstrated that Mexican American children, regardless of cognitive style, required fewer trials when personal rewards were employed. The present study failed to reflect field independence/dependence as a major dimension of individual differences. (NQ)

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THE EFFECT OF PERSONAL AND IMPERSONAL REWARDS ON THE LEARNING PERFORMANCE OF FIELD INDEPENDENT-DEPENDENT MEXICAN-AMERICAN CHILDREN

Flora Ida Ortiz, Ph.D.
Assistant Professor
University of California
Riverside

and

Steve J. Morelan, Ph.D.
Assistant Professor
University of Puget Sound
Tacoma, Washington

Paper Presented To The American Educational Research Association Annual Meeting
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ABSTRACT

The effect of personal and impersonal rewards on the learning performance of Mexican-American subjects classified as field independent or dependent was investigated. A rote verbal learning task was used too as an index of current learning ability. One half of the subjects from each group (FI & FD) were assigned at random to one of two learning conditions: personal or impersonal. A 2 x 2 analysis of variance was used to analyze the data and the results demonstrated that Mexican-American children, regardless of cognitive style, required fewer trials when personal rewards were employed. These results were discussed with respect to Bilingual Education and conditions of learning.

THE EFFECTS OF PERSONAL AND IMPERSONAL REWARDS ON THE LEARNING PERFORMANCE OF FIELD INDEPENDENT-DEPENDENT MEXICAN-AMERICAN CHILDREN

Until recently, standardized intelligence tests have been used for the purpose of individualized instruction and educational placement. This approach has resulted in a large percentage of children from certain ethnic or national groups to be classified as slow learners or as mentally retarded. This problem of classification and educational program placement is particularly relevant to the public schools in California with respect to Mexican-American children. In the Mexican-American group the slow learners are not the exception, but are a large majority. According to Ross, DeYoung and Cohen (1971) these findings, however, are the result of institutional racism rather than appropriate testing procedures. Many standardized psychological tests have limited utility in evaluation of children from various ethnic groups.

Using Mexican-American and Anglo-American children of different IQ levels ranging from 60 to 120, Jensen (1961) reported that the majority of Mexican-American children with low IQ's are actually quite normal in basic learning ability. He suggested they may be poor in scholastic performance for reasons other than inherently poor learning ability. According to Ramirez and Price-Williams (1973), one reason for poor learning ability is that the educational environments are not individualized with the cognitive styles of most Mexican-American children. "Unless educators respect and incorporate the child's values and preferred styles of learning,

the schools cannot begin to provide culturally democratic learning environments" (Castaneda, Ramirez, & Herold, 1972, p. 10). According to Cohen (1969) the school requires one specific approach to cognitive organization - analytic - so the ability to use it well becomes more critical at higher grade levels. He reports that "pupils with inadequate development of these skills and those who develop a different cognitive style could be expected not only to be poor achievers early in their school experience but also to grow worse, comparatively, as they move to higher grade levels" (p. 829).

Support for cultural differences in cognitive styles in children has been demonstrated (Kuzma & Stern 1972; Lesser, Fifer & Clark, 1965; Stodolsky & Lesser, 1967; Witkin, Goodenough, & Karp, 1967). According to Keogh (1973), the term "cognitive style" refers to individual consistencies in information seeking and information processing across a variety of problem-solving situations. Over a decade ago, a perceptual-personality dimension referred to as field independence-dependence was described and empirically supported (Witkin, Lewis, Hertzman, Machover, Meissner & Wapner, 1954). After an extensive review of the literature pertaining to the work of H.A. Witkin and associates, Keogh (1973) reported that the major construct under empirical investigation is variously referred to as field dependence-independence, global-analytic functioning, or field articulation. Briefly, subjects' perception strongly influenced by the context or background are termed "field dependent" while subjects able to overcome the influence of a surrounding perceptual field are described as "field independent." According to Witkin (1965), there is considerable evidence that a tendency toward one way of perceiving is a con-

sistent, pervasive characteristic of an individual's perception.

According to Kuzma and Stern (1972) sociologists have indicated that the Mexican-American home does not provide the kind of independence training necessary to develop achievement motivation. Field independent cogritive styles are typical of members of cultures which are characterized by formally organized family and friendship groups, while field dependent cognitive styles are typical of members of cultures which are characterized by shared-functional groups (Ramirez & Price-Williams, 1973). Mexican-American children tend to be more field dependent than Anglo-American children. However, there is diversity of cognitive style within ethnic groups. Witkin (1965) reports that scores for any large group on tests of cognitive style shows a continuous distribution. Therefore, it is critically important to assess individual differences in cogaitive style according to objective procedures and not on ethnic background alone.

Three major assessment techniques have traditionally been used to measure the field independence/dependence construct: the Room and Body Adjustment Test, the Rod and Frame Test, and the Witkin Embedded Figures Test. The Rod and Frame Test has been modified making it portable for use outside the laboratory in a variety of settings. Use of the portable Rod and Frame tests by "independent investigators with a variety of subject populations has resulted in consistent findings as to age changes and sex differences, lending support to the validity of the portable technique" (Koegh, 1973 p. 13).

Messick (1969) has proposed that cognitive style may interact with treatment or instructional variables which influence learning, retention, and transfer. Individualized teaching methods and curriculum may, therefore, depend upon individual differences in cognitive style. Recently, a school program was implemented by Ramirez and Castaneda (1972) on the basis of differences in the cognitive styles of Mexican and Anglo-American pupils. According to Keogh (1973), it is presumed that cognitive styles interact with instructional strategies to facilitate or to impede learning. In general, field dependent children prefer cooperation (group achievement) while field independent children learn most efficiently when emphasis is placed on competition (individual achievement). Furthermore, the field independent child is influenced less by statements of authority figures while the field dependent child is influenced by approval and disapproval. Impersonal rewards which do not strengthen the relationship between the teacher and student (e.g. gold stars, grades, special privileges) are valued by the field independent child. In contrast, the field dependent child values personalized rewards which make the relationship between teacher and child closer (e.g. embraces, smiles, approving tone of voice). These teaching strategies have been developed by Castaneda, Ramirez, and Herold (1972).

Despite wide interest and considerable research efforts directed toward explication of individual differences in cognitive style, there has been limited systematic application of this construct to educational practice (Keogh, 1973). Educational investigations have notably neglected aptitude treatment interaction research (Reynolds, 1963) despite repeated pleas for research designed to identify aptitude-treatment interactions (Yesseldyke, 1973). According to the authors' review of the literature, there has been a

paucity of research investigating the learning ability of field independent-dependent children using direct measures of present learning ability.

The purpose of this study was to investigate the effect of cognitive style and learning conditions on the rote verbal learning performance of Mexican-American children. The paired associate task was chosen because it reflects current learning ability, rather than a static measure of achievement, and component stages of learning can be analyzed. Using a modification of the component analysis model proposed by Underwood and Schulz (1960), Prehm and Mayfield (1970) have identified three stages in learning a list of paired associates. The first stage, response learning, reflects when the subject recalls the response as a unit. The second stage, associative one, reflects the first correct association between stimulus and response while the third stage, associative two, indicates the actual mastery of the correct association. The utilization of these three stages in conceptualizing human learning is appropriate if the paired associate task is considered as a series of complex discrimination problems preceeding the actual associative connection between stimulus and response (Prehm, 1970). This component analysis was employed in the current study to provide for a precise analysis of the learning process(es). Cognitive style (field independent/dependent) and and learning conditions (personal and impersonal rewards) were the independent variables while trials to criterion at each of three component stages (RLS, AS-I, and AS-II) served as the dependent variables.

METHOD

Subjects

Forty-four Mexican-American children, $9\frac{1}{2}$ to 12 years, enrolled in a public school in Southern California, and considered to have normal intelligence were selected from a population of 60 subjects on the basis of cognitive style. The portable Rod and Frame Test was used to classify subjects as field independent or field dependent. Approximately one third of the subjects (22) were classified as field independent with a mean of 3.86 while one third (22) were classified as field dependent with a mean of 20.01. The chronological age of both groups was similar with a mean of 128.86 and 130.73 months for subjects classified as field independent and dependent, respectively. Table One summarizes the CA and FI/FD characteristics of the sample.

Insert Table One About Here

Materials

The learning materials used in the investigation consisted of one list of five non-meaningful paired associates. The pictorial stick figure stimuli were reproductions of those used by Stinnett (1968) and Ferneti (1969) while the response was a three digit number (127, 157, 234, 347, 589). The stimulus and response items were printed on one side of a 4 3/8" x 8 3/4" white card; the stimulus alone on the reverse side of the card.

Procedure

Prior to the paired associate task, all the subjects were individually administered the Portable Rod and Frame Test. Each subject was required to set a movable rod to a true vertical position, regardless of the tilt of the frame; the scores were recorded in degrees from vertical. These scores were used to classify subjects according to cognitive style, field independent or field dependent.

The subjects were then tested in one of two distraction free rooms within the school by one of two experimenters, both Mexican-American. One half of the subjects from each group (FI & FD) were assigned at random to one of two learning conditions: personalized and impersonalized rewards. The E presented each card to the S manually at the rate of five seconds per card with an inter-trial interval of 20 seconds. The Ss were required to repeat the digit which corresponded to the correct stimulus item. At the end of each trial the cards were shuffled to randomize their position. The lists were learned using the Modified Method of Adjusted Learning (Prehm and Mayfield, 1970). Rather than being dropped from the list after each correct response, items were retained until the subject correctly associated stimulus and response items on three consecutive trials. Response learning stage performance was evaluated by determining the first trial on which each subject correctly recalled each of the five response items. Associative stage one scores represent the first correct pairing of the response and stimulus. Associative stage two scores represent consistent pairing of the response with its stimulus.

The E provided personalized or impersonalized rewards depending on the previous random assignment of the FI/FD children. During the personalized learning condition, the E emphasized the needs, feelings, and interests of the student and said such things as:

1. "I like the way you are learning."
2. "I am proud of you."
3. "You will have to tell your teacher how well you are doing." Or demonstrated approval (smiling, nodding, touching).

During the impersonalized learning condition, the E emphasized the importance of the task and said such things as:

1. "Do the best you can, I want to see if you can work these problems on your own."
2. "Let's see if you can do this problem faster than others."
3. "If you learn these pairs, you will get a prize or star."

The learning session lasted from 25 to 40 minutes after which the child was escorted back to his school room and thanked for his participation.

RESULTS AND DISCUSSION

A 2 x 2 analysis of variance was used to analyze trials to each of three component stages of learning. The results of the analysis on the first two stages, response learning and the first associative stage, indicated no significant main effects or interaction. However, analysis of the third component stage, associative stage two, indicated a significant main effect for learning condition ($F = 4.95$; df. = 1, 40; $p < .05$). The other main effect and interaction did not reach significance. The results demonstrated that subjects, regardless of cognitive style, required only 1.55 trials to consistently pair the response with its stimulus when personalized rewards were employed as compared to 6.05 trials when impersonalized rewards were used.

The results of this study parallel and confirm the results of numerous studies that have been conducted over the years on the differential effects of social reinforcement on the learning performance of children. In general, superior performance under conditions of praise has been found (Anderson, White, and Wash, 1966; Terrell and Kennedy, 1957; Irwin and Renner, 1969). To explain the differential effect of personal and impersonal rewards on learning performance, the impersonal rewards might have functioned similar to a condition of no feedback thus creating a mild reproof. This is consistent with the results found by Hurlock (1924) which indicated that praise was more effective than reproof with average learners. However, after an extensive review of the literature on the effects of praise and reproof Alexander (1970) reported that the bulk of the studies tend to support a rather equivocal position as to the use of praise or reproof in learning situations with children. The results generally support the position that personalized social reinforcement is an important condition to enhance the learning performance of Mexican-American children.

In addition, the results demonstrated that difference in performance were not evident during the early stages of acquisition, but only during the later stages. This finding suggests that personalized rewards which strengthen the relationship between teacher and child are important when the learning task requires achievement motivation and/or when the task is difficult. In a study using paired associates with Mexican-American children, Jensen (1961) similarly reported that the paired associates test took longer than other tests and that "there seemed to be a waning motivation and an increasing frustration in a number of the subjects" (p.156).

The results cast doubts on the importance of assessing individual differences in cognitive style to ensure optimum efficiency when learning a standard paired associate task.

The non-meaningful nature of the learning task in this study tends to refute the position that FI children learn more rapidly than FD children when the material consists of abstract designs or other impersonal material. Furthermore, the results do not support the contention that FD children are influenced more by approval and disapproval from authority figures than are FI children. It is incumbent upon educators to make a detailed examination of the relationship between ability measures and the measures used to define field independence/dependence (Dubois & Cohen, 1970).

A failure to demonstrate an interaction effect does not support the position that cognitive style interacts with instructional categories to facilitate or impede learning (Castaneda, Ramirez, & Herold, 1972; Messick, 1969; Ramirez & Price-Williams, 1973). These results provide little or no information upon which to base differential assignment of Mexican-American children to instructional programs. The functional nature of interactions and relationships between learning and field dependence remains obscure (Keogh, 1973). Rather, the process of educating Mexican-American children is more complex than matching cognitive styles to an instructional program.

SUMMARY AND CONCLUSION

This study fails to provide empirical information upon which to base differential assignment of children to instructional programs based on

cognitive style. The claim that programs should be differentiated on the basis of learning styles and that failures in school can be explained on the basis of cognitive style was not supported. However, the results generally support the position that personalized social reinforcement is an important technique for classroom instruction. Ensuring that personalized incentive rewards are used with Mexican-American children will enhance a positive school experience.

Despite research which has documented and found individual consistencies in cognitive styles to be related to a larger aspect of personality (Keogh, 1973), the present study failed to reflect field independence/dependence as a major dimension of individual differences. Differences might have been found if more complex learning tasks requiring higher level problem solving abilities were employed. This suggests the importance of continued interest in (1) learning styles, (2) requirements of the learning task, (3) instructional strategies, and (4) the interaction of these variables when developing instructional programs for Mexican-American children. These results should not be used to reject the construct of cognitive style, but should be used to focus continued empirical investigations on the complex problems of how children perceive, think, and process information.

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Table 1

Subject Characteristics

Groups	Number	Statistic	CA*	FI/FD**
Field Independent	22	Range	115-143	.75-8
		Mean	128.86	3.86
		s.d.	8.53	2.26
Field Dependent	22	Range	114-147	14-29
		Mean	130.73	20.01
		s.d.	8.70	4.97

*Chronological Age listed by months

**Scores recorded in degrees from vertical